













## Enzymes

- Proteins, amino acid strings
- assembled from amino acids based on "blueprints"

## Enzyme Polymorphisms

- poly = multiple, "morph" = forms
- For many (all?) enzymes, there are small differences in blueprints across the population (e.g., blood types)

## MTHFR C677T Polymorphism

Genotype	% Pop	Enz Act.
C/C	~35%	100%
C/T (T/C)	~50%	~66%
T/T	~15%	~50%

- Follow-on study:
  - Five 1C polymorphisms
  - Expanded biochemistry/metabolomics
  - Vision and related medical data
  - n = 70/72 ISS astronauts

## MTRR A66G

























